Chapter 5

5.1 Mendel and his Peas

I. Heredity

A. the passing of traits from parents to their offspring is called heredity

B. Gregor Mendel studied heredity by performing experiments with pea plants

1. Mendel noticed that certain traits skipped generation in plants

2. He chose pea plants because they self-pollinate

a. self-pollinating plants have both male + female reproductive systems

b. Mendel was able to develop true breeding plants; these plants produced offspring that all had the same traits

c. pea plants also cross-pollinate, this is where the pollen of a plant fertilizes the ovule of a plant

d. pollen may be carried by bees, wind, bats, etc.

C. Mendel studied one characteristic at a time

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a. a characteristic is a feature that has different forms in a population

b. the different forms of characteristics are called traits

D. Mendel manipulated plants to control the breeding of traits

III Mendel's First Experiments

A. Mendel crossed true-breeders with different traits

1. First-generation plants (offspring of first cross) always display dominant traits for true-breeders of parent generation

B. When Mendel crossed first-generation plants the second generation was found to express b a dominant + recessive trait

1. The ratio of dominant plants to recessive in 2nd generation consist-thy equaled 3:

C. Mendel realized that 3:1 ratio of 2nd generation plants of true breeders for a tra was the result of each parent donating a set of instructions

D. Genetic Research is one of the fastest

Nov 27-1:28 PM

5.1 Review

Grade: 7th

Subject: Life Science

Date: 11/27

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1 A plant that has both male and female reproductive structures is able to ...

A self-replicate

B self-pollinate

C change colors

D none of the above

Nov 27-9:33 AM

2 In cats, there are two types of ears: normal and curly. A curly-eared cat mated with a normal-eared cat, and all the kittens had curly ears. What type of trait are curly ears?

B recessive
C co-dominant

A dominant

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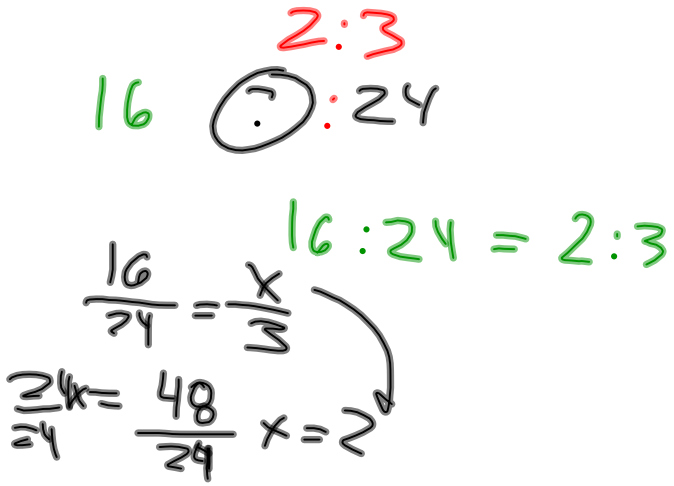
3 The passing of traits from one generation to the next is known as _____.

heredity

Nov 27-9:37 AM

4 If the ratio of brown to green candies is 2:3, how many brown candies are there if there are 24 green candies?



Nov 27-9:41 AM

5 A trait that reappears in the second generation after disappearing in the first generation when parents with different traits are bred is the _____ trait

A dominant

C incomplete dominant

B recessive

Nov 27-9:42 AM

6 A feature that has different forms in a population is a _____.

A trait

B characterisitc

Nov 27-9:43 AM

5.2 Traits and Inheritance

I. Genetic Instructions

A. Genes - instructions for inherited trait

B. Alleles - different forms of a gene

1. Shown with letter in a pedigree → A a

C. Phenotype - an organism's physical appearance

1. Pea plants, its various colors: humans are more complicated

D. Genotype - the inherited genetic information that determine phenotype

1. Result from inherited alleles

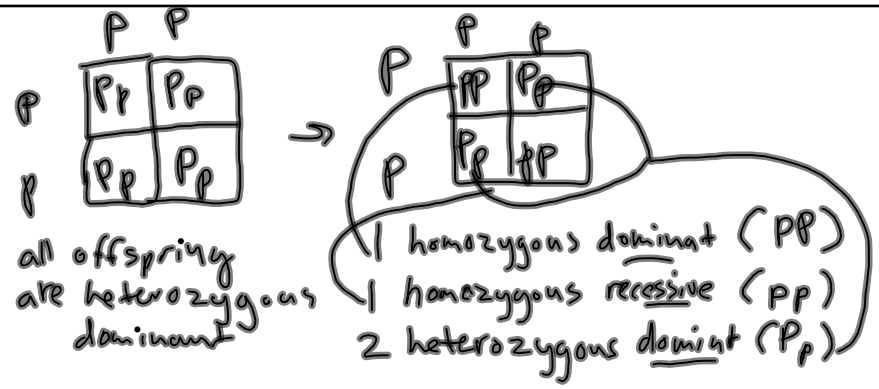
2. 2 same alleles = homozygous

3. 2 different alleles = heterozygous

E. Punnet Square - used to organize all possible genetic combinations of offspring from particular parents

Nov 28-9:21 AM

ex:



F. Evidence for inheritance

1. When two heterozygous dominant alleles are crossed, the Ratio always equals 3:1

II What are the chances

A. Each parent has two alleles for genes

1. Chance of getting one allele or another is random as a coin toss

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B. Probability - the chance of something happening

1. a possibility / the total possibilities

III More about traits

A. Incomplete Dominance - when traits do not blend together, but each allele has its own degree of influence

B. One gene many traits

C. Many traits, one gene

D. Environtal influences can effect phenotype

Nov 28-2:01 PM

Life Science 5.2

Grade: 7th

Subject: life science

Date: 11/28

Nov 28-9:49 AM

1 One set of instructions for an inherited trait is a gene .

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2 One of the alternative forms of a gene that governs a characterisitic is a(n) _____.

A phenotype

C genotype

B allele

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3 An organism's appearance or other detectable characteristic is the genotype.

True

False

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4 The entire genetic makeup of an organism is their _____.

B phenotype
C allele
A genotype

Nov 28-9:54 AM

5 The likelihood that a possible future event will occur in a given instance of an event is the _____.

probability

Nov 28-9:55 AM

5.3 Meiosis

Keywords	Notes
Asexual Reproduction	→ only one parent cell is needed, make exact copies of the cell → known as mitosis
Sexual Reproduction	→ two parents contribute sex cells to form offspring (meiosis)
Homologous chromosomes	→ chromosomes that carry sets of genes → humans have 46 chromosomes, 23 pairs of homologous chromosome
Meiosis	→ process of making sex cells → copying process that produces cells with half the usual # of chromosomes → genes are located on chromosomes ★→ 6 steps of Meiosis (see p. 128-129) ★

Nov 28-2:10 PM

Keywords	Notes
Mendel + Meiosis	→ Meiosis confirmed Gregor Mendels results ★→ See Figure 4 Meiosis + Dominance p. 130 → Through the process of fertilization, the egg combines with the sperm to form new cell
Sex chromosomes	→ one of pairs of chromosomes that determines a person's sex → carry genes that determine sex → for humans: females have 2X chromosomes + males have 1X and 1Y chromosome

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Keyword	Notes 5.7 Meiosis cont.
Sex-linked disorders	→ Y chromosome does not carry all of genes of an X chromosome → genes for certain disorders are carried on specific sex chromosomes → color blindness and hemophilia = X chromosome
Genetic counseling	→ helps predict whether a person is a carrier of a hereditary disease through use of a pedigree
Pedigree	→ a diagram that is a tool for tracing a trait through generations of a family
Selective breeding	→ organisms with desirable traits are mated

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Summary:

→ In Meiosis, chromosomes are copied once, and then the nucleus divides twice

→ process of meiosis produces sex cells, which have half the number of chromosomes. Two halves combine during fertilization (reproduction)

→ In humans, females have two X chromosomes. Males have X + Y chromosomes. Therefore, males can contribute a X or Y chromosome during reproduction

→ sex-linked disorders occur in males than females.

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Chapter 5 Review

Grade: 7th

Subject: Life Science

Date: 12/6

Dec 6-10:26 AM

1 Genes are found on ...

B proteins
C alleles
D sex cells

A chromosomes

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2 Genes carry information that determines ....

A alleles
B ribosomes
C chromosomes

D traits

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3 The process that produces sex cells is....

A mitosis
B photosynthesis

D probability

C meiosis

Dec 6-10:29 AM

4 The passing of traits from parents to offspring is called....

A probability

C recessive
D meiosis

B heredity

Dec 6-10:30 AM

5 If you cross a white flower with the genotype pp with a purple flower with a genotype PP, the possible genotypes in the offspring are...

A PP and pp

C all PP
D all pp

B all Pp

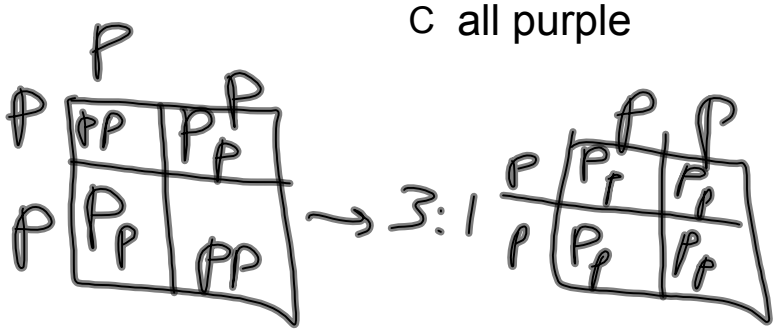
Dec 6-10:31 AM

6 From the last question, what would the phenotypes be?

A all white
B 3 purple and 1 white

D half white, half purple

C all purple



Dec 6-10:33 AM

7 In meiosis...

A chromosomes are copied twice
B The nucleus divides once

D two cells are produced from a single cell

C Four cells are produced from a single cell

Dec 6-10:35 AM

8 When one trait is not completely dominant over another, it is called...

A recessive

C environmental factors
D uncertain dominance

B incomplete dominance

Dec 6-10:39 AM

9 Sperm and eggs are known as _____.

Dec 6-10:40 AM

10 _____ produces cells with half the normal number of chromosomes

Dec 6-10:40 AM

11 Different versions of the same genes are called Alleles.

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